

# **JOINT MEETING OF THE GOVERNOR'S P-20 COUNCIL AND THE GOVERNOR'S COMMITTEE ON TEACHER QUALITY AND SUPPORT**

**Friday, November 18, 2005  
3:00 P.M.**

## **AGENDA**

*Notice is hereby given to Members of the Governor's P-20 Council, the Governor's Committee on Teacher Quality and Support and the general public that the P-20 Council and the Governor's Committee on Teacher Quality and Support will hold a joint meeting, open to the public, on Friday, November 18, 2005, 3:00 p.m., at 1700 W. Washington, Governor's 2<sup>nd</sup> Floor Conference Room, Phoenix, Arizona. Public comment will be taken. The P-20 Council and the Committee on Teacher Quality and Support will discuss and may take action on the following Matters. Members will attend either in person or by telephone conference call.*

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|--|--|
| 1. Call to Order & Introductions<br>Co-Chair Governor's P-20 Council<br>Chair Governor's Teacher Quality and Support | Dr. Rufus Glasper<br>Dr. John Haeger                     |
| 2. Welcome & Meeting Overview  | Governor Janet Napolitano                                |
| 3. Presentation & Discussion: Robotics Program –<br>Carl Hayden High School (Local Program)                          | Dr. Allan Cameron  |
| 4. Presentation & Discussion: Arizona Science<br>Coordinators Association (Statewide Program)                        | Dr. W. Barry Roth  |
| 5. Presentation & Discussion: The BioScience Discovery<br>Alliance of Arizona (BDAA) (Regional Program)              | Roxanne Morris, Supt.<br>Saddle Mountain School District |
| 6. Call to the Public  | Dr. Rufus Glasper  |
| 7. Announcements and Adjournment   | Dr. Rufus Glasper  |

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## GOVERNOR'S P-20 COUNCIL

November 18, 2005

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**Agenda Item No.** 1.

**Subject:** Call to Order &  
Introductions

**Submitted by:** Debra Raeder  
Executive Director

### ----- Background Information -----

Dr. Rufus Glasper, Co-chair of the P-20 Council, and Dr. John Haeger, Chair of the Governor's Teacher Quality and Support Committee, will call the meeting to order, and provide for introductions of both groups.

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#### Council Action

**Requested:** None.

**Attachments:** None.



## GOVERNOR'S P-20 COUNCIL

November 18, 2005

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<b>Agenda Item No.</b>	2.
<b>Subject:</b>	Welcome and Overview
<b>Submitted by:</b>	Debra Raeder Executive Director

### ----- Background Information -----

#### Welcome & Meeting Overview: Governor Janet Napolitano

A recent report by The National Academies stated that in the United States, 12-graders recently performed below the international average for 21 countries on a test of general knowledge in mathematics and science. The report goes on to state that an advanced mathematics assessment was administered to students in 15 other countries who were taking or had taken advanced math courses, and to U.S. students who were taking or had taken pre-calculus, calculus, or Advanced Placement calculus. Eleven countries outperformed the United States, and four scored similarly. None scored significantly below the United States.

As we look at the global picture, the advances Ireland has made in education, economic development, and global competitiveness must be noted. Ireland has become the richest country in the European Union after Luxembourg. How did this happen?

How do we look at these startling statistics in context to how Arizona students are performing, which by anyone's data is relatively low? What programs and initiatives would be beneficial to Arizona students to increase their performance in math and science? Today's agenda will begin to lay that foundation as the P-20 Council strives to identify the problems as well as the solutions to systemically improving math & science skills.

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<b>Council Action Requested:</b>	None
<b>Attachments:</b>	None



## GOVERNOR'S P-20 COUNCIL

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<b>Agenda Item No.</b>	3.
<b>Subject:</b>	Robotics Program – Carl Hayden High School
<b>Submitted by:</b>	Debra Raeder Executive Director

### ----- Background Information -----


#### **Presentation & Discussion: Robotics Program – Carl Hayden High School**

The Carl Hayden High School Science & Technology club has been very successful in the past four years and they have been getting national media exposure. This inner-city school has been competing in engineering competitions with the best high schools and universities in the country and winning. The Falcon Robotics team will share their strategies for how to get students interested in math, science and technology. The team will also show how they have taken their message to the feeder grade schools in the Carl Hayden area and to Phoenix College and Arizona State University. The sponsors of the club also have a proposal that might help with stimulating interest or excitement for math, science & technology in Arizona's schools to help prepare the students for the technologically based economy that Arizona is driving towards.

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<b>Council Action Requested:</b>	None
<b>Attachments:</b>	PowerPoint Presentation

Carl Hayden H.S. Falcon Robotics, Team 842



**Education Under Pressure**  
*Extracurricular Engineering Excellence*

Allan Cameron  
 Fredi Lajvardi

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Carl Hayden H.S. Falcon Robotics, Team 842

**Teachers**

**Faridodin "Fredi" Lajvardi**  
*Program manager for Marine Science Magnet Program  
 Science & Technology club sponsor  
 Electric Vehicle program - Catapult Competition  
 - BOV - Ham Radio - Robotics - Lego League*



**Allan Cameron**  
*Teacher Computer Science and Innovative Technology  
 Science & Technology club sponsor  
 Electric Vehicle program - Catapult Competition  
 - BOV - Ham Radio - Robotics - Lego League*



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Carl Hayden H.S. Falcon Robotics, Team 842

**Falcon Team Members (5 of 50)**

Oscar (Alumni)  
 Annalisa (Senior, President)  
 Cristian (Senior)  
 Rebecca (Junior)  
 Alan (7<sup>th</sup> grade)



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Carl Hayden H.S. Falcon Robotics, Team 842

### *Carl Hayden Community High School*

- ❖ Inner city public high school  
(35<sup>th</sup> Ave & Roosevelt)
- ❖ 93% Hispanic population
- ❖ 100% of feeder school students on federal lunch program
- ❖ Magnet Programs

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Carl Hayden H.S. Falcon Robotics, Team 842

### *Our Team's Mission Is To . . .*

- ❖ Engage Students in Science, Engineering, and Invention
- ❖ Try something New
- ❖ Students Create Technology
- ❖ Facilitate and Share Knowledge
- ❖ Be Creative
- ❖ Have Fun

" . . . to create a world where science and technology are celebrated where young people dream of becoming science and technology heroes "

Dean Kamen

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Carl Hayden H.S. Falcon Robotics, Team 842

### *FIRST Robotics Competition (FRC)*

- ❖ 1000+ teams worldwide
  - ❖ United States, Canada, Brazil, Great Britain, Ecuador, Israel
- ❖ 22 Regional Competitions
  - ❖ Mar 9-11 2006, 40 teams, Veterans' Coliseum)
- ❖ 1 Championship
  - ❖ Apr 27-29, 2006, 300 teams, Atlanta GA



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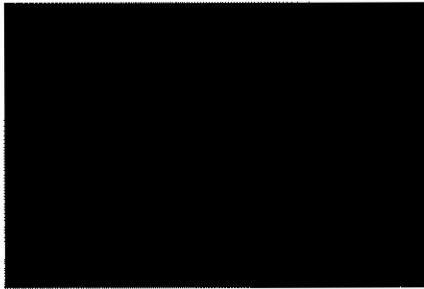
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Carl Hayden H.S. Falcon Robotics, Team 842

**FIRST**



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"FIRST isn't just about building robots, its about developing life skills. The kids learn skills in relationships, teamwork, finance, budgeting, and project management. The partnership between academia, the community and industry will build our future employees and our future citizens."

Steve Sanghi President and CEO Microchip Technology

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Carl Hayden H.S. Falcon Robotics, Team 842

### Arizona's FIRST Teams:

**39 Highland High School**

America West Airlines Educational  
Grant / General Motors Desert  
Proving Grounds Gilbert

**60 Kingman USD #20**

Ford Motor Company/  
Southwire/ Laron Incorporated,  
Kingman

**498 Cactus High School**

Glendale

**842 Carl Hayden High School**

Honeywell/ Intel/ Wells-Fargo/  
Phelps-Dodge/ Arthur M. Blank  
Foundation, Phoenix

**991 Brophy College Preparatory**

Tommy Gate Company/ Jake's  
Handyman Service, Phoenix

**1011 Sonoran Science Academy**

Tucson

**1013 Queen Creek HS**

Intel, Queen Creek

**1492 AZ Community Robotics**

Microchip, Tempe

**1726 Buena High School**

US Army IEWTD, Sierra Vista

**1798 Flowing Wells High School**

Tucson

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Carl Hayden H.S. Falcon Robotics, Team 842

### *MATE's Goals*

- ❖ Design and build ROV
- ❖ Increase interest and awareness in marine technology fields
- ❖ Develop career skills
- ❖ Networking:  
Students - teachers - professionals

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### *MATE Underwater ROV Competitions*

- ❖ 60+ teams worldwide
  - ❖ United States, Canada
- ❖ Two Classes
  - ❖ Explorer (Universities)
  - ❖ Ranger (High School)
- ❖ 7 Regional Competitions
- ❖ 1 Championship
  - ❖ June, 2006, 40 teams, Houston TX

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### *Arizona's MATE ROV Teams*

- ❖ Carl Hayden High School
- ❖ Chandler High School
- ❖ Phoenix Community College
- ❖ Arizona State University



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Other Activities






❖ Trebuchet

❖ Lego

❖ Vex

❖ Electric Car

❖ Amateur Radio

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VIPs

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
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Carl Hayden H.S. Falcon Robotics, Team 842

Mentors

❖ Marcos Garcia-Acosta

❖ Intel Latino Network

❖ Publicity Advocate

❖ Carol Lindsey, John Borge

❖ Phelps-Dodge

❖ Students' Presentations

❖ Karen Suhm, Jerry Little

❖ Inventivity

❖ Electrical, Programming

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## Vertical articulation

- Grade schools
- Community colleges
- ASU

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## Student GPA +17% (April 2003)

Student GPA before and during Robotics Team membership

N=20, 11 Male, 9 Female

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## Engineering Majors

ASU Engineering Majors from Carl Hayden									
Year Entered ASU	Asian		Black		Hispanic		White		Grand Total
	F	M	F	M	F	M	F	M	
1994						2		1	3
1995							1		2
1996						1	1	3	5
1997							1		5
1998					3	1		1	5
1999						2			2
2000					1	3	1		5
2001					1		1		2
2002						3			3
2003	1				2	2		1	7
Total	1		1		6	10	2	15	43

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### *This Year's Projects*

#### ❖ Commitments

- ❖ VEX robotics
- ❖ FIRST Lego Robotics
- ❖ FIRST Robotics
- ❖ MATE ROV



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#### ❖ "On the Drawing Board"

- ❖ DROVER
- ❖ Jr. High Articulation
- ❖ Lego Workshop
- ❖ Lego Scrimmage
- ❖ University Articulation
- ❖ Engineering Curriculum & certificate
- ❖ Change the Culture

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### *Arizona Extracurricular Academic Association (AEAA)*

- ❖ Sanction events
- ❖ Legitimize STEM extracurricular activities
- ❖ Provide some funding
- ❖ Support Competitions and Activities

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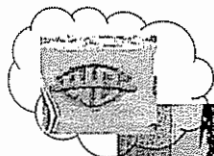
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Carl Hayden H.S. Falcon Robotics, Team 842

*Thank You*

⇨ Fredi Lajvardi  
 ⇨ Allan Cameron  
 ⇨ Falcon Robotics Team

[www.FalconRobotics.org](http://www.FalconRobotics.org)  
 Email  
[N7UJJ@cox.net](mailto:N7UJJ@cox.net)  
[coachfredi@hotmail.com](mailto:coachfredi@hotmail.com)



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*Some Findings from FIRST Study*

More than Robots:  
 An Evaluation of the FIRST Robotics Competition  
 Participant and Institutional Impacts

Alan Melchior Faye Cohen Tracy Cutler and Thomas Leavitt  
 Center for Youth and Communities  
 Heller School for Social Policy and Management  
 Brandeis University  
 Waltham, MA  
 April 2005

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*FRC Provides the Challenging Experience and Positive Relationships Associated with Positive Youth Development*

**Real and Challenging Experiences**

- ⇨ 89% of FRC alumni reported that they had "real responsibilities"
- ⇨ 76% had a chance to play a leadership role
- ⇨ 74% reported that team members made the important decisions
- ⇨ 94% felt they had learned new skills

**Positive Relationships**

- ⇨ 95% reported getting to know an adult very well
- ⇨ 91% felt they learned a lot from the adults on the team
- ⇨ 91% felt they "really belonged" on the team
- ⇨ 94% had fun working on the team

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### *FRC Alumni Report Positive Impacts on a Variety of Attitudes and Skills*

#### **Attitudes: Teamwork, Gracious Professionalism, and Self-Confidence**

- 95% report an increased understanding of the value of working on a team and 83% increased their understanding of "gracious professionalism."
- 89% reported increased self-confidence.

#### **Increased Interest in Science and Technology**

- 89% reported an increased understanding of the role of science and technology in solving real-world problems.
- 69% reported increased interest in science and technology careers.

#### **Workplace-Related Skills**

- 90% or more reported learning new communications skills, teamwork skills, problem-solving and decision-making skills (solving unexpected problems; managing time, assessing information, etc.)

#### **Overall Assessments**

- 95% rated their experience as "good" or "excellent."
- 46% reported that FRC had been "much more influential" than their other extracurricular activities in high school.

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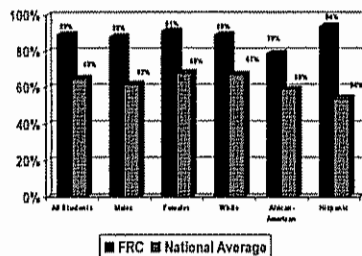
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### *FIRST Alumni Were More Likely to Go on to College than the Average Student Nationally*



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### *At College, a High Proportion of FRC Alumni had Courses and Internships Related to Science and Technology*

- 87% of FRC alumni took at least one math course; 78% took at least one science course.
- 51% took an engineering course.
- 58% had at least one science/technology internship, apprenticeship, or job in college.
- 13% had a math, science, computer or engineering grant or scholarship (66% had any type of scholarship or grant).

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Discipline	FRC (%)	Matched Comparison Groups (%)
General Engineering Dept	55	28
Engineering Dept	45	17
Engineering Internships	30	1
General 1st Year	78	17
General 2nd Year	45	29
General Engineering Job	35	4
Graduate School	67	83

Table 1. All differences are statistically significant at the 0.05 level or greater.

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Antioch Governor 1920 Council



Major	FRC Women	Female Companion	FRC Men	Non-White Companion
BSEngineering Major	42%	25%	48%	32%
Engineering Major	32%	8%	36%	22%

Differences are statistically significant at the 10 level \*at the 05 level or greater

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Category	FRC (%)	Matched Comparison (%)
Volunteer as First Year	32%	71%
Tutoring	38%	3%
Advising/Coaching	27%	6%
First priority	38%	1%
Single/committed	26%	2%
No classes	44%	3%
Do Pomos off	23%	11%

1433 All efficiencies are statistically significant at the 5% level or greater.

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Arizona Governor P20 Council



## GOVERNOR'S P-20 COUNCIL

November 18, 2005

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**Agenda Item No.** 4.

**Subject:** Arizona Science  
Coordinators  
Association

**Submitted by:** Debra Raeder  
Executive Director

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### ----- Background Information -----

#### **Presentation & Discussion: Arizona Science Coordinators Association (ASCA)**

Dr. Barry Roth will update the Council on the ASCA. ASCA views the role of K-12 education as crucial in providing students with the knowledge and skills necessary to be competitive in technologically advanced careers. When locating their facilities, industry leaders place a high value on the quality of the K-12 educational system offered by competing states and municipalities. ASCA identifies the following as critical aspects of K-12 science education that must be addressed to make Arizona a key player in the bioscience industry:

- Adequate time for science instruction must be built into the daily instructional calendar. Currently, emphasis on reading, writing and mathematics has eroded instructional time so that in some schools and school districts, little or no science is taught.
- Teachers, particularly those in K-8 classrooms, require additional professional development in science content and pedagogy. This need is magnified by the Highly Qualified provision of No Child Left Behind.
- Funding and certification issues at the high school level must be addressed. Current funding through Career and Technical Education sources (Carl Perkins Act) require CTE certification to access. Collaboration between science and CTE must be facilitated to maximize the effectiveness of this funding.
- Teacher salaries must be competitive with those found in the private sector if we are to attract and retain the best and brightest. Currently, one third of new teachers leave teaching within the first three years. The most common reasons cited are working conditions and salary.

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**Council Action Requested:** None

**Attachments:** PowerPoint Presentation

**ASCA**  
Arizona Science Coordinators Association

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Workforce Development in the Biosciences  
November 18, 2005

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**ASCA**  
Arizona Science Coordinators Association

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- School Districts
- State Universities
- Community Colleges
- Informal Education
- Private Non-profit Foundations

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**ASCA**  
Arizona Science Coordinators Association

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Mission:

to unite as science leaders in  
Arizona to promote standards-based  
science curriculum, instruction and  
assessment to all students

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**ASCA**  
Arizona Science Coordinators Association

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The Battelle report identifies strengthening the K-12 science programs as a "critical" need.

*Pg. 63*

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**ASCA**  
Arizona Science Coordinators Association

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Adequate time is needed for science instruction

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**ASCA**  
Arizona Science Coordinators Association

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Teachers require additional professional development in content and pedagogy.

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**ASCA**  
Arizona Science Coordinators Association

Funding and certification issues  
at the high school level must be  
addressed

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**ASCA**  
Arizona Science Coordinators Association

Teachers' Salaries must be  
competitive

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**ASCA**  
Arizona Science Coordinators Association

"...significant improvements must  
be made in the K-12 system if  
Arizona's youth are to become the  
biosciences workers of  
tomorrow "

*Battelle Report pg 27*

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## Sample Recommended Instructional Time

# Arizona School Improvement Program

### RECOMMENDED MINUTES OF INSTRUCTION FOR ELEMENTARY SCHOOLS

	Primary Grades (1-3)		Upper Elementary (4-6, including 7 & 8 if self contained)	
	Daily	Weekly	Daily	Weekly
Developmental Reading	90 Min.	450 min.	60 min.	300 min.
Language Arts	60 min.	300 min.	60 min.	300 min.
Mathematics	60 min.	300 min.	60 min.	300 min.
Social Studies	30 min.	150 min.	40 min.	200 min.
Science	30 min.	150 min.	40 min.	200 min.
Physical Education	*30 min.	120 min.	*30 min.	120 min.
Art	**15 min.	60 min.	**15 min.	60 min.
Music	**15 min.	60 min.	**15 min.	60 min.
Health	** <u>15 min.</u>	<u>60 min.</u>	<u>15 min.</u>	<u>60 min.</u>
Total	345 min.	1650 min.	335 min.	1600 min.

\*It is recommended that this be scheduled and taught at least 120 minutes per week

\*\*It is recommended that this be scheduled and taught at least 60 minutes per week

It is assumed the normal six hour day will provide for 360 minutes of instructional activities in which children are under the guidance and direction of teachers in the teaching process. The above recommendations provide 15 minutes for primary grades and 25 minutes for upper elementary grades that the teacher can schedule additional activities that are in the best interest of the youngsters. The school week should consist of 1800 minutes of instruction at both the primary and upper elementary grade levels. This allows approximately 150-200 minutes of instruction time per week to be used at the discretion of the teacher. It should be noted that in both the daily and weekly schedule that reading and language arts activities should be incorporated into other instructional areas, and rich content should be incorporated into reading and language arts.

The Arizona Department of Education gratefully acknowledges the work of the Missouri Department of Education in providing a sample of recommended elementary school instructional minutes.

# ASCA

## Arizona Science Coordinators Association

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November 18, 2005

### **K-12 Education and Workforce Development for the Bioscience Industry**

ASCA views the role of K-12 education as crucial in providing students with the knowledge and skills necessary to be competitive in technologically advanced careers such as those in the biosciences. When locating their facilities, industry leaders place a high value on the quality of the K-12 educational system offered by competing states and municipalities. ASCA identifies the following as critical aspects of K-12 science education that must be addressed to make Arizona a key player in the bioscience industry.

- Adequate time for science instruction must be built into the daily instructional calendar. Currently, emphasis on reading, writing and mathematics has eroded instructional time so that in some schools and school districts, little or no science is taught.
- Teachers, particularly those in K-8 classrooms, require additional professional development in science content and pedagogy. This need is magnified by the Highly Qualified provision of No Child Left Behind.
- Funding and certification issues at the high school level must be addressed. Current funding through Career and Technical Education sources (Carl Perkins Act) require CTE certification to access. Collaboration between science and CTE must be facilitated to maximize the effectiveness of this funding.
- Teacher salaries must be competitive with those found in the private sector if we are to attract and retain the best and brightest. Currently, one third of new teachers leave teaching within the first three years. The most common reasons cited are working conditions and salary.

#### **Summary**

To become scientifically literate, Arizona students must have adequate instructional time to participate in scientific inquiry and reflect upon their learning. Teachers of science require adequate training to provide their students with quality science instruction. Funding sources must be made available to provide schools and school districts with the resources required to support science, math, and technology instruction, and to attract and retain highly qualified teachers.



## GOVERNOR'S P-20 COUNCIL

November 18, 2005

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**Agenda Item No.** 5.

**Subject:** BioScience Discovery  
Alliance of Arizona

**Submitted by:**  
Debra Raeder  
Executive Director

### ----- Background Information -----

#### **Presentation & Discussion: BioScience Discovery Alliance of Arizona**

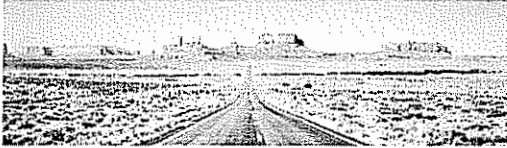
Roxanne Morris, Superintendent of the Saddle Mountain School District, will discuss an exciting new project that is being formed within the State of Arizona to introduce our school children to the rigors and excitement of working in the field of bio-technology. With the combined collaboration and support of 12 school districts representing over 100,000 students, local and state government and businesses through out the state, the project is well positioned to accomplish this goal. Inspiring students to engage in international scientific discovery is the goal and will be accomplished in three ways. First, the development of sophisticated, interactive and rigorous new curricula. Second, internships at TGEN, Mayo Clinic and other health/research facilities. Third, use of the Internet to transmit actual conversations with leading scientists, as they discuss their discoveries, not yet available even in textbooks, with students through out the state

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**Council Action Requested:** None

**Attachments:** PowerPoint Presentation

## Bio-Science Discovery Alliance of Arizona



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What has been done to  
date?

- <http://www.knowledgenetworksolutions.com/asap/>

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### Vision Statement

- To inspire students and educators to engage in international scientific discovery

### Mission Statement

- Arizona shall be internationally renowned for bioscience education programs that enable practicing research scientists to guide students and faculty to utilize innovative technologies for life solutions

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## Why?

- The BioScience Discovery Alliance of Arizona (BDAA) has been formed in Arizona between education and non-profit bioscience research for a collaboration to create project-based bioscience curriculum to encourage students and teachers to achieve higher levels of achievement and interest in the field
- Scientists and researchers will collaborate interactively with students and teachers on real research using multiple technologies to find cures for today's diseases
- The outcomes will be; to (1) have students meet and exceed state and national science standards; (2) draw new businesses and families to the state with high education standards for their children; (3) educate and provide students career and financial opportunities in bioscience and supporting industries

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## Examples:

- Geneticists can tell you whether you have a mutation in the APC Gene, which can lead to a form of hereditary colon cancer or flaw in PSI – red flag for Alzheimer's.
- Scientists can predict reactions to certain medications

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## Hopefully, we can help

- Reaping the fruits of the human genome sequencing project through alleviating the suffering of patients will only be possible if available genetic information is combined with the skilled professionalism of health care workers and ethically solid standards  
<http://www.sciencemag.org/cgi/content/full/291/5507/1224>

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### "Our" students:

- Working with our science teachers on real time research with genetic scientists across the country
- Serving internships @ TGen, Mayo, and other health/research facilities
- Working (through virtual classrooms) with students across the nation – the world!

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### The goal

- Develop curriculum that augments state/district curriculum
- Provide real time research opportunities for students
- Raise \$5-6M for the project
- Be active in the schools in w/in next 3 years

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### E-Learning E-Rate Eligible Services

Digital Transmission  
Connectivity  
Encoding  
Equipment  
Decoding Equipment

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## E-Learning E-Rate Non-Eligible Components

- Video Camera
- Microphones
- Amplifiers
- Recording Equipment (i.e. VCR)

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## E-Learning E-Rate Summary

- School's investment in E-Learning is minimal. E-Rate covers the most expensive components (encoders and decoders)
- School's investment will be less than \$ 10,000.00 for each site participating in the collaborative video network.

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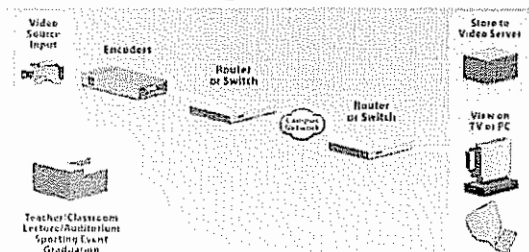
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## E-Learning Network




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Questions?



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## GOVERNOR'S P-20 COUNCIL

November 18, 2005

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**Agenda Item No.** 6.

**Subject:** Call to the Public

**Submitted by:** Debra Raeder  
Executive Director

### ----- Background Information -----

This item provides Council members an opportunity to hear public comment on agenda items. Comments not specific to agenda items, according to open meeting laws, may not be addressed by the Council

In order to ensure that all individuals desiring to speak during the public comment period be properly acknowledged and to allow sufficient time for the comments, we ask that a "Request to Speak" information sheet be completed and submitted to either the Council Chair or staff prior to the beginning of the meeting. **Comments are limited to three minutes.**

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**Council Action Requested:** None

**Attachments:** None



## GOVERNOR'S P-20 COUNCIL

November 18, 2005

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**Agenda Item No.** 7.

**Subject:** Announcements  
Adjournment

**Submitted by:** Debra Raeder  
Executive Director

### ----- Background Information -----

Announcements:

- a. Next Meeting of the P-20 Council: December 6, 2005 - 10:30 a.m.
- b. Other

Adjournment.

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**Council Action Requested:** None

**Attachments:** None